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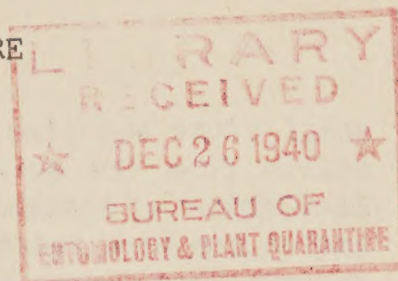
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UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Entomology

Washington, D. C.



February 20, 1933.

To Experiment Station
and State Entomologists:

(NOT FOR PUBLICATION)

MEMORANDUM REGARDING SPRAY RESIDUE PROBLEMS ON GRAPE

This memorandum is an additional supplement to the Department letter of January 20 addressed to State entomologists, State agricultural colleges, experiment stations, and extension services, discussing the present situation as to spray residue with special reference to lead and certain problems of residues on leafy vegetables. The present memorandum deals with the residue problems involved in the control of chewing insects on grapes. The recommendations in this memorandum are based on experimental information obtained in the Lake Erie grape districts, and are therefore applicable chiefly to conditions that occur in the northeastern part of the United States. They are necessarily subject to modification to meet varying field conditions and the results of later investigations.

INSECTICIDES

To avoid lead residues, it is recommended that calcium arsenate be substituted for lead arsenate wherever possible, and particularly in post-blossom applications. Calcium arsenate used in Bordeaux spray with fish oil as a sticker has consistently given practical control of the berry moth equivalent to that obtained with lead arsenate on both Concord and Catawba grapes. Certain experiments, however, indicated that calcium arsenate is somewhat more likely than lead arsenate to cause injury to varieties having tender foliage. With the variety Ives, calcium arsenate caused occasional injury to the fruit stems.

GRAPE BERRY MOTH

Repression by cultural control. - Every effort should be made to keep the berry moth population at a minimum. Experiments and observations in northern Ohio vineyards have shown that comparatively slight modifications in cultural practices aid materially in reducing the over-wintering population. Plowing or cultivation late in the fall should be avoided in order to leave the over-wintering cocoons on the surface of the ground during winter and thus exposed to natural destructive agencies. During the spring or early summer the cultivation should be such as to bury the cocoons beneath the surface of the ground

until after the time of maximum emergence of the adult moths. The escape of adults from the soil may be prevented by a comparatively shallow covering. In a number of vineyards in which these practices have been followed, the population has been reduced to a point where a shortened spray schedule has given a satisfactory degree of control of the berry moth. It is urged that consideration be given to the use of these or similar modifications of cultural practices in other localities.

Control of the first brood essential. - Most of the spray residue on harvested grapes is caused by late spraying for the control of the grape berry moth. Many analyses of fruit have shown that the application of arsenicals after the first post-blossom spray is almost certain to result in excessive arsenical residue at harvest time. The strongest emphasis should therefore be placed on the control of the first brood in order to avoid the necessity for spraying later in the summer. The pre-blossom and post-blossom spray applications, particularly the latter, should be extremely thorough. In localities in which the infestation by the first brood is light, or where it has been reduced to a low point by cultural practices, this schedule will give satisfactory control of the berry moth, and will enable a grower to bring his crop to maturity with a minimum of residue.

Control program. - The following program for the control of the grape berry moth is recommended subject to limited modification to meet local conditions. Detailed recommendations as to the fungicides should be obtained from plant pathologists.

<u>Time</u>	<u>Treatment</u>
Fall	No cultivation. Leave cocoons exposed to weather and natural enemies.
Spring	Cultivate in manner to cover cocoons. Keep them covered until after the blooming period.
Just before blooming period	Spray thoroughly with calcium arsenate 1-1/4 pounds in 50 gallons, plus Bordeaux mixture and fish oil* 1/2 pint in 50 gallons. (The use of an arsenical may be unnecessary in localities in which the berry moth larvae do not appear in numbers until after the blooming period.) For this spray lead arsenate may be substituted for calcium arsenate.
Immediately after blooming period	Spray thoroughly with calcium arsenate 1-1/4 pounds in 50 gallons, plus Bordeaux mixture and fish oil* 1/2 pint in 50 gallons.

*If fish oil is not available, linseed oil may be substituted.

CONTROL OF THE GRAPE ROOT WORM

The time when the grape root worm adults appear varies in different localities and from season to season. The beetles feed only on foliage, but maximum numbers often appear at a time when thorough applications of arsenicals will increase the residue on the grape clusters. Applications for the control of this insect should be directed to the foliage, and care taken to avoid spraying the clusters. Although it is reasonable to suppose that calcium arsenate would be effective for the control of this insect, it has not been tested. Pending such tests, the use of lead arsenate seems necessary.

CONTROL OF MINOR LEAF-CHEWING INSECTS

Many species of leaf-chewing insects--including the grape leaf folder the eight-spotted forester, and various species of sphinx moths--are normally kept under control by insecticides applied early in the season. In case these insects appear later in the season in numbers requiring treatment, calcium arsenate should be used. The spray should be directed against the foliage, and care taken to avoid placing the insecticide on the berries. Many of these minor leaf-chewing insects can be controlled by the use of calcium arsenate dust, with a reduction in residue at the time of harvest.

RESIDUE REMOVAL

The Department has conducted experiments with the removal of arsenical residues from grapes. It has been found feasible to wash grapes used for juice purposes at the pressing plant. Table grapes can be washed and shipped wet, although it necessitates very careful handling in baskets of 12-quart size or less, and the danger of mold development is increased. It has not been found possible to dry grapes satisfactorily. Further information on this subject may be obtained from the Bureau of Plant Industry.

S. A. Rohwer,
Acting Chief of Bureau

